

5 CLAIMS

1. A method of recovering base metal from a tailings dump which includes the steps of:

- 10 (a) aerating a surface layer of the dump;
- (b) adjusting the pH and the moisture content of the surface layer to provide conditions favourable for bacterial oxidation of sulphide minerals;
- (c) allowing bacterial oxidation to take place for a controlled period;
- (d) after the controlled period removing the oxidised surface layer and adding water thereto to form a slurry;
- 15 (e) separating the slurry into solids and a solution; and
- (f) recovering base metal from the solution.

2. A method according to claim 1 wherein the surface layer is aerated by agitating or mechanically loosening the surface layer.

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3. A method according to claim 2 wherein the surface layer is aerated by ploughing the surface layer to a depth of between 0,5 to 1,0 metres.

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4. A method according to any one of claims 1 to 3 wherein the pH is adjusted to a level in the range of from 1,3 to 2,0.

5. A method according to any one of claims 1 to 4 wherein the pH is adjusted by adding sulphuric acid to the surface layer.

5 6. A method according to any one of claims 1 to 5 wherein the moisture content of the surface layer is adjusted to a value in the range of from 16% to 20%.

7. A method according to claim 6 wherein the moisture content is adjusted to a value of the order of 18%.

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8. A method according to any one of claims 1 to 7 wherein the said controlled period, in step (c), is at least four weeks.

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9. A method according to any one of claims 1 to 8 wherein the oxidised surface layer is removed by at least one of the following: by mechanical means, and by the use of water jets.

10. A method according to any one of claims 1 to 9 wherein the slurry is directed to at least one tank in which agitation of the slurry takes place.

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11. A method according to any one of claims 1 to 10 wherein base metal in sulphate form in solution is separated from the slurry.

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12. A method according to any one of claims 1 to 11 wherein step (f) is carried out using solvent extraction or ion exchange techniques.

13. A method according to any one of claims 1 to 12 used for the recovery of copper from a tailings dump.

5 14. A method according to claim 13 wherein the tailings result from the grinding of
copper ores followed by a flotation process.

15. A copper recovery process wherein copper ore is ground and then subjected to a
flotation process which results in tailings which are transferred to a tailings pile, and
10 wherein the tailings pile is subjected to the following: a surface layer of the pile is
loosened and aerated, the pH of the surface layer is adjusted to a value in the
range of from 1,3 to 2,0, the moisture content of the pile is adjusted to lie in a range
of from 16% to 20%, and at least sulphide minerals in the surface layer are
bacterially oxidised for a controlled period, whereafter the surface layer is removed,
15 mixed with water to form a slurry which is conveyed to at least one agitation tank
and, in the tank, the slurry is separated into solids and a solution from which copper
is extracted using solvent extraction or ion exchange techniques.